SECOND SERIES MARCH 1938 VOL. 14, NO. 3

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

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Published monthly by THE NEW YORK ACADEMY OF MEDICINE
2 East 103 Street, New York

Entered as second-class matter, February 3, 1928, at the Post Office at New York, N. Y., under the Act of August 24, 1912. Subscription $2.00 per year. Single copies, 25 cents

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BULLETIN OF
THE NEW YORK ACADEMY
OF MEDICINE

MARCH 1938

CLINICAL ASPECTS OF CALCULUS DISEASE*

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ONE FINDS in the more recent urological literature many contributions relative to calculus disease. These articles deal largely with the etiology of stone formation and its correlative subject, the prevention of recurrence. To the urologist, at the present time, this is probably the most important and interesting phase of the subject. Much of the knowledge gained by these researches, however, must still be classified as theoretical, and a true evaluation can only be made after further investigations have been carried out, especially along the lines of chemistry, bacteriology, and body metabolism.

The clinical aspects of lithiasis is a broad subject indeed, and one which obviously can only be touched upon in the limited space allotted. To form the basis for these observations (which are directed primarily to those practicing in fields other than urology, especially the general practitioner), I have briefly reviewed cases of calculus disease that have been under my observation in hospital and private practice during the past six years, and attempted to elicit certain points in the clinical histories which would be of greatest interest.

During these years we have been able to utilize all of the most modern

* Delivered November 9, 1937 in the Tenth Annual Graduate Fortnight

methods of urological diagnosis, which have been particularly efficacious in the study of lithiasis; we have also worked in the light of our modern conception of the etiology of stone formation.

In order of frequency, calculi have been encountered most often, (1) in the ureter, (2) kidney, (3) bladder, (4) prostate, and (5) urethra. That the greatest incidence of calculi is to be found in impacted ureteral calculi is not surprising. The majority of all calculi are formed in the kidney, and while still of a size sufficiently small to make it possible, descend into the ureter and become impacted, where as a rule they give rise to symptoms of sufficient severity to focus attention upon their presence and result in their detection.

The alertness exhibited by the general practitioner in suspecting the possible presence of a ureteral calculus with the first appearance of suggestive symptoms, is an agreeable commentary upon more recent urological teaching. I well recall hearing Dr. C. H. Mayo make the statement years ago, that practically every patient coming to the Clinic with a right ureteral stone had already had the appendix removed, and often in the presence of a left sided calculus, the pain in the latter instance being interpreted as referred pain.

One cannot say that such instances do not occur even in this enlightened period, but they are much less common. A sudden severe pain in the flank, side or groin is now looked upon with suspicion by both physician and surgeon, and an x-ray is usually taken. If, as often happens, urinary symptoms are also present, and pus, blood cells, and possibly crystals are found in the urine, the diagnosis of lithiasis will soon be made. On the other hand, a predominance of gastro-intestinal symptoms and a high blood count, so commonly encountered in cases of acute appendicitis, will frequently exclude the possibility of a calculus. Formerly the appendix was removed at once, and a persistence of symptoms attributed to the presence of adhesions; by the time a correct diagnosis was finally made, an unnecessary operation had been carried out and much time lost. Today in hospital practice, with all facilities at hand, doubtful cases are seldom allowed to rest without a complete urological work up, including ureteral catheterization, retrograde and excretory urograms, and laboratory tests.

In many instances the clinical picture of impacted ureteral calculus is not typical, and may be confused with various types of acute pathology associated with the abdominal viscera, as well as chronic diseases of the

gallbladder, gastro-intestinal tract, or genital system. Symptoms relative to calculi are caused by obstruction, by local irritation, and by superimposed infection. If calculi lodge in the ureter and remain there without causing complete obstruction, they may attain an incredible size, as in several instances which came under my observation. Such large calculi often give rise to symptoms so slight that they remain undiagnosed for years. The term "silent stones" has often been applied in such cases. This term implies a certain false sense of security and lends comfort to the patient, while, even in the absence of pain and urinary symptoms, the calculus may be slowly causing kidney destruction, resulting in a progressive loss of function. Furthermore, the absence of a shadow in a plain film cannot be accepted as proof that a ureteral calculus is not present. It has been estimated by some, that as high as 10 per cent of ureteral calculi will not cast a shadow. While a pure uric acid stone may occasionally be missed, other methods of diagnosis such as a scratch on a wax bulb, or the presence of a filling defect when a contrast urographic medium is employed, should leave a much narrower margin of error.

While discussing ureteral calculi, I would like to call your attention to a phenomenon often referred to as passing gravel. An attack of pain quite typical of renal colic and often associated with gastro-intestinal symptoms, will be followed by hematuria, dysuria and urinary frequency. X-rays are usually negative, but the urine if examined repeatedly will show uric acid, or more often calcium oxalate crystals, possibly a visible sediment; also blood cells, and as a rule pus cells. When the bladder is examined, hemorrhagic areas are often observed in the mucous membrane of the trigone, bas-fond, and especially in the immediate vicinity of one or both ureteral orifices, which may also be surrounded by an area of edema. The lumen of the ureter may be free, or partially obstructed; frequently one is able, by means of lavage of the ureter, to wash out a sediment of crystals. These occurrences have been more often encountered during the spring and summer, and have seemed to be associated with gastro-intestinal disturbances in patients who have ingested large quantities of fresh vegetables and fruits high in calcium content. All have presented a clinical picture so clear cut, and have occurred with such regularity, that I am inclined to believe that these observations regarding the etiology of this type of case are well founded.

It has been estimated that probably 40 per cent of all ureteral calculi will pass without instrumentation. Statistics have also shown that another

40 per cent will pass following intra-ureteral manipulation. Here again, as in all urological work, application of the proper treatment should be based upon the several findings in the individual case, rather than being guided only by the size and position of the calculus. Surprisingly large calculi often pass following very little manipulation, while very small stones may resist repeated efforts to dislodge them. Just what happens to a calculus following an attack of colic, the number of colics, the presence or absence of urinary infection, the amount of back pressure upon the kidney and resulting interference with kidney function (as evidenced by the ureteral and pelvic dilatation so well demonstrated by urograms and verified by estimations of blood chemistry) are important guides upon which a decision should be based as to whether intra-ureteral manipulation should be continued or a calculus should be removed surgically.

Intra-ureteral manipulation is not without risk. Traumatism inflicted by such maneuvers may lead to stricture formation, and predispose to infection; the latter, when superimposed upon a kidney subjected to back pressure, may result in serious damage to the kidney, ending in a nephrectomy. A clean-cut surgical removal of an impacted calculus may, in certain instances, prove to be the more conservative treatment. Certainly, gentleness in manipulation and repeated careful check-ups, especially of kidney function, are constant requisites when cystoscopic methods are being employed.

A series of 114 ureteral calculi under treatment since 1931 showed twenty-two removed by uretero-lithotomy, ninety-two passed following intra-ureteral manipulation, with no mortality. Two patients are still undergoing manipulations, and as yet have resisted repeated attempts to dislodge the calculi. Once a calculus has descended through the ureter, seldom is difficulty encountered in its passage from the bladder. If not expelled at once, small stones may be removed by cystoscopic methods.

As has been stated, a large percentage of urinary calculi form in the kidney and pass into the ureter. A certain number, however, will remain attached to a papilla, or in a calyx, or in the kidney pelvis, until they reach a size which prohibits their passage into the ureter. If a calculus becomes impacted at the ureteropelvic junction, a renal colic will ensue which will not be relieved until the stone becomes dislodged. Calculi lodged in a calyx or minor calyx may give rise to a dull pain in the loin, but seldom to a sharp colic; stones not infrequently remain in a kidney

Fig. 1

Prostatic calculi. Symptoms relieved by treatment.

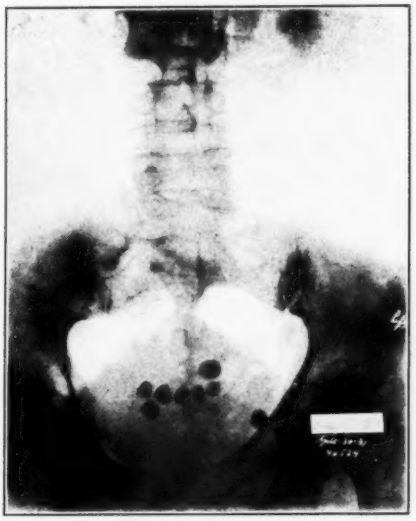

Fig. 2

Vesical calculi. Suprapubic cystotomy and prostatectomy.

Fig. 3

Vesical calculi. Litholopaxy and transurethral resection

Fig. 4

Jackstone vesical calculus. Litholopaxy.

Fig. 5

Calculus in vesical diverticulum. Litholopaxy and transurethral resection.

Fig. 6

Large vesical calculus.

Fig. 7

Same case as Fig. 6. Urogram shows pelvic kidney also.

Fig. 8

Calculus in either ureter; also multiple calculi in both kidneys. Ureteral calculi passed following manipulation.

Fig. 9

Five ureteral bougies in ureter. Calculus passed subsequently.

Fig. 10

Impacted ureteral calculus. Excretory urogram shows dilatation of ureter above the calculus. Calculus passed following manipulation.

Fig. 11

Impacted ureteral calculus. Ureterolithotomy.

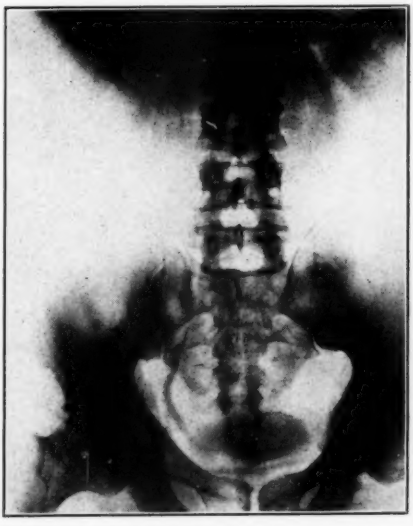

Fig. 12

Calculus impacted in single ureter. Passed following manipulation.

Fig. 13

Giant ureteral calculus. No acute symptoms. Ureteronephrectomy.

Fig. 14

Giant ureteral calculus. No symptoms. Ureterolithotomy.

Fig. 15

Hydronephrosis secondary to long continued ureteral obstruction from calculus.

Fig. 16

Calculus in right ureter and left kidney. Ureterolithotomy and pyelonephrotomy.

Fig. 17

Filling defect in left kidney due to presence of uric acid calculus.

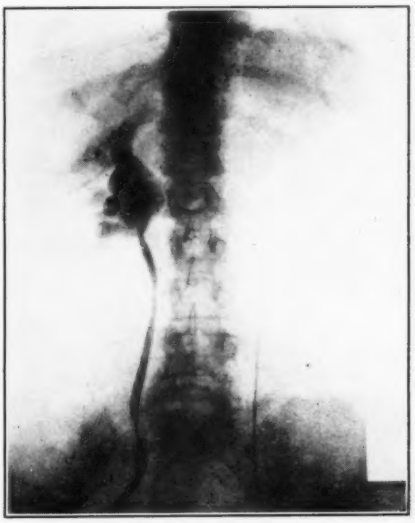

Fig. 18

Small calculus in right kidney. Pelviolithotomy and plastic operation on kidney pelvis.

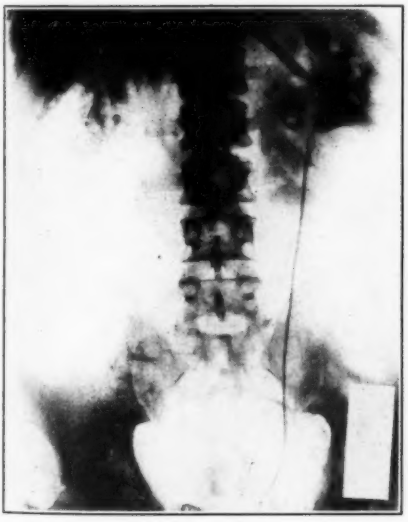

Fig. 19

Renal calculus and ruptured kidney.

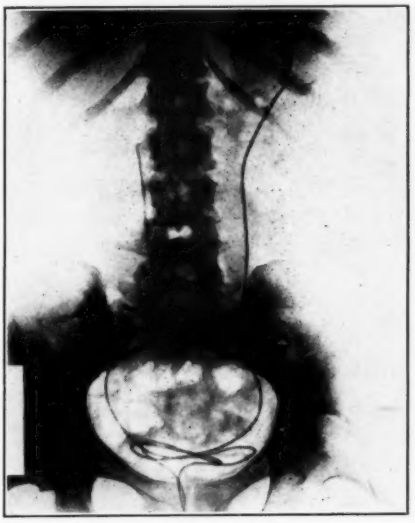

Fig. 20

Renal calculus.

Fig. 21

Same case as Fig. 20. Rupture of kidney with perinephritic abscess.

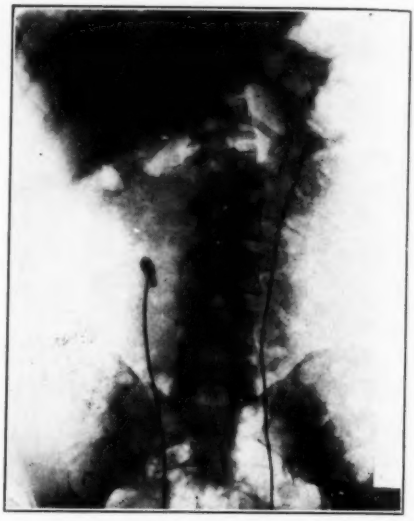

Fig. 22

Renal calculus.

Fig. 23

Same case as Fig. 22. Destruction of kidney parenchyma secondary to calculus obstruction. Nephrectomy.

Fig. 24

Renal calculi observed over a period of 20 years with slight increase in size.

until they attain a size sufficient to fill the entire pelvis and calyces causing little more than a dull ache, possibly no pain at all.

It has been surprising to me, in reviewing forty-nine cases of kidney stones treated during this period, to note in how many instances, without a preexisting suspicion of their presence, renal calculi were detected in x-rays taken as part of a routine examination to determine the cause for abdominal symptoms, or for the presence of pus and blood cells in the urine.

Calculi have been found more often in kidneys subject to some interference with drainage, either mechanical, anatomical, or pathological. Multiple calculi occurred more often in the presence of urinary infection. Bilateral calculi were present in eleven cases, in four of which no operation was carried out, while in seven, both kidneys were incised, an interval being allowed to elapse between operations. Obviously conservative surgery is an important requisite when bilateral calculi are under consideration. That over one-third of all operations for renal calculi required a nephrectomy, is proof of the destruction of tissue that may result secondary to the presence of lithiasis, and emphasizes the danger of regarding calculi as innocent or harmless even in the absence of symptoms.

Surgery may be contra-indicated in certain instances of calculus disease. In rare instances I have observed stag-horn calculi, also single or multiple calculi, that have remained in a kidney for periods of years, apparently giving rise to no untoward results. The presence of calculi should, however, be regarded as a potential hazard to the individuals who harbor them, and such individuals should be subjected to periodic examinations. Of forty-nine kidney operations for renal stone during the period from 1931, seventeen required nephrectomy, eleven nephrolithotomy, and nineteen pelviolithotomy, with no operative mortality.

A combination of renal and ureteral stones has been frequently encountered; in three instances calculi were present in both kidneys and both ureters. The management of such cases calls for the best of surgical judgment. The migration of kidney and ureteral calculi necessitates an x-ray of all patients harboring stones of small size immediately preceding operation. In the presence of multiple calculi, an x-ray of the kidney before the patient leaves the operating table is an important safeguard.

Vesical calculi are, in most instances, primarily renal calculi that have descended into the bladder and, owing to the presence of some path-

ology in that organ which interferes with its complete emptying (most often prostatic obstruction or a diverticulum), remain in the bladder to increase in size. Where there is urinary retention and alkaline decomposition, calculi may form primarily in the bladder; incrustations are also frequently associated with tumors of the bladder. Vesical calculi are rarely found in the female, and when present, have as a rule a foreign body as a nucleus.

It is difficult to believe that vesical calculi could, in the light of present methods of diagnosis, be overlooked and remain in the bladder to attain large size; and yet in this recent series in which twenty-three bladder stone cases are included, twelve varied in size from that of an English walnut to a hen's egg. Regarding their composition, an occasional stone may be nearly pure uric acid or calcium oxalate, but a lamellated structure is more commonly found in which phosphates and carbonates are mixed with the above.

Small vesical calculi give rise to more acute symptoms than larger ones, for the same reason that applies to renal calculi, i.e., small calculi, by engaging in the vesical orifice, are able to obstruct the outlet of the bladder more completely, and also, in moving about more freely they cause more irritation of the mucous membrane.

The early symptoms of stone in the bladder—frequency, urgency, hematuria and pyuria—are often attributed to prostatic obstruction. As a calculus increases in size, the symptoms may become less severe, and patients may go on for years with urgency and frequency by day when a plain x-ray film would reveal its presence. In fourteen of the twenty-three recent cases, the calculus or calculi were removed incident to a prostatectomy or prostatic resection, while nine others were successfully removed by litholopaxy or cystotomy.

Litholopaxy is an entirely satisfactory procedure when employed in suitable cases, and when carried out by one familiar with the technique. In the absence of traumatism, this operation results in a great saving of time to the patient. A preliminary transurethral resection may be advisable in one case, while in another the calculus may be crushed and evacuated, and a resection or prostatectomy employed as a subsequent procedure. Such manipulations require distinctly more skill for their execution than do open operations; the results, however, in properly selected cases, are brilliant. The kidneys frequently are subjected to a severe degree of back pressure from the presence of vesical calculi,

especially calculi of large size; caution is therefore necessary in the preparation of these patients for operation. Too sudden a relief of back pressure may result in uremia.

Prostatic calculi are encountered as small seed-like bodies (usually found at prostatectomy and located between the hypertrophied prostate and its capsule) or as definite calculi, usually multiple, and commonly composed of calcium oxalate. True calculi may be palpated as hard areas in the prostate; unless crepitus be elicited, they may easily be confused with carcinoma of the prostate. An x-ray, however, differentiates the two conditions at once.

Calculi may remain in the prostate for years and cause no symptoms; however, when infection supervenes, relief can seldom be obtained by any means short of a removal of the prostate. Of sixteen cases of prostatic calculi observed during this same period, eleven were treated by prostatectomy while five had symptoms of such a mild nature that they have been made comfortable by local treatment.

Urethral calculi (under which one excludes prostatic calculi that may have become dislodged) represent renal or vesical calculi which in their passage have become engaged in the urethra. One patient in this series suffered from six such impactions. The calculus in each instance was withdrawn with forceps. In two cases the calculus was pushed back into the bladder and removed with the cystoscopic rongeur. In another case an external urethrotomy was necessary for the removal of the stone.

A complete urological work-up of every case of lithiasis is necessary before deciding whether the treatment to be applied should be surgical, or whether cystoscopic manipulations are indicated; or in the presence of contra-indications to the above, whether one should depend upon medical measures in the hope of controlling the disease.

With the removal of a calculus, treatment has but begun. The elimination of urinary stasis is an important step; urinary infection should be eradicated; a familiarity with *all elements* entering into the etiology of stone formation is essential, that a proper regimen may be instituted, for only by such means may a recurrence be prevented.

The recurrences that I have encountered during the past six years have, with one exception, occurred in cases of multiple stones; one was in a case of bilateral single renal calculi, the composition of the stones being reported as pure calcium oxalate; a second was in a case of multiple bilateral renal oxalate stones; a third had multiple renal and ureteral

calculi composed of calcium and magnesium phosphate; and a fourth was a case of multiple vesical calculi composed of calcium oxalate and calcium phosphate (both of the latter had a strongly alkaline urine); a fifth case had a recurrence of a renal calculus of pure uric acid composition. In these cases every effort was made through the establishment of satisfactory urinary drainage; the elimination of foci of infection; increased elimination from the intestinal tract; the employment of a strict dietary regimen, supplemented by repeated studies of blood chemistry and metabolism, and local treatment of the kidneys by pelvic lavage to eliminate all constitutional and local factors which might predispose to calculus re-formation.

In the cases presenting recurrent oxalate and uric acid calculi, constipation was a predominant predisposing factor which was difficult to relieve. Each of these cases continued, notwithstanding the above measures, to show calcium oxalate crystals in the urine. One case was lost to observation after six months of treatment, still harboring a recurrent renal calculus of increasing size. Two were reoperated (one twice), but have been free from further recurrence for three and four years respectively, although one still shows oxalate crystals in the urine from time to time. The two cases of multiple phosphatic stones were reoperated, one by cystotomy and the second on the opposite kidney and both ureters. They have now been free from calculi for two and four years respectively, although intermittently they both show triple phosphate crystals in the urine. Acidification of the urine has not always been possible. However, sulfanilamide has been of decided value in eliminating the proteus infection so often present in these cases. Dissolution of calculi, except in one case of cystinuria observed eighteen years ago, has not been observed.

In concluding these remarks I wish to emphasize the necessity of being ever alert to: the possible presence of a calculus as a cause for urological or general symptoms, whether clear-cut or vague, or as an etiological factor in pyuria and hematuria; that every case presenting suspicious symptoms, or pus, blood, or crystals in the urine should at least have a plain x-ray film; that the presence of a calculus is always a liability to the individual who harbors it; and that the best of judgment, based upon a complete urological and general physical work-up, is necessary to apply proper treatment intelligently and prevent a recurrence.

EDEMA AND ITS TREATMENT*

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IT HAS been our good fortune in the last two or three decades to see many of the manifestations of disease subjected to genuine scientific analysis. Hitherto, classical clinical descriptions had merely enumerated these manifestations, designating them by the major diagnosis with which they were associated. Thus, we spoke of nephritic edema, cardiac edema or inflammatory edema. With the new analytic point of view it is necessary to discard this elementary identification and perform what may be called a physiological dissection, arriving thereby at the underlying mechanisms concerned in the production of edema in each individual case.

It is necessary, therefore, in discussing with you the problem of edema in nephritis to review the basic forces concerned in causing an increase of water in the intercellular spaces, i.e., edema. Time limitations prevent an exhaustive presentation of all the facts, hence I shall try to include only fundamental principles; first a brief exposition of the physiological equilibria whose alteration leads to edema formation, and then an analysis of the important types of Bright's disease for the presence of these alterations. Of necessity, such a program is further limited by constant collision with the barriers that still separate us from the unexplored fields of knowledge. It is only by comparison with the lack of understanding of twenty-five years ago, that the physician can indulge in a complacent attitude as to present knowledge.

The interstitial fluids are kept constant in the normal person by a remarkable balance between the *physical* pressure of the blood in the capillaries, derived primarily from the heart beat, and the *osmotic* pressure of the plasma, derived essentially from its proteins. This is the famous Starling hypothesis. Many careful investigations have proved that this hypothesis stands the test of quantitative analysis and that the exact figures for the two pressures expressed in equivalent terms, such as milli-

* From the Department of Medicine, College of Physicians and Surgeons, Columbia University, and the Presbyterian Hospital. Delivered November 2, 1937, in the Tenth Annual Graduate Fortnight.

meters of mercury, have the appropriate relationships. At the arterial end of the capillary, the physical pressure exceeds the osmotic pressure so that fluid moves out into the tissues; at the venous end of the capillary the osmotic pressure is increased by the concentration resulting from this loss of water and the physical pressure is decreased for similar reasons, so that fluid then passes back into the capillary. Experiments on animals have shown that the physical pressure on the arterial end is approximately twice that on the venous. The net result of this dynamic equilibrium between filtration and reabsorption is the maintenance (in the normal) of a constant water content in the intercellular spaces. Disease, however, can change either the capillary blood pressure or the osmotic pressure to such an extent that normal conditions cease to exist. Under these circumstances edema may then appear. Even in the normal, it is possible to cause slight edema of the ankles by standing over long periods of time adding thereby, the pressure of gravity to the normal capillary pressure.

Exact measurement of only one of these pressures is possible in the light of our present knowledge. This is the osmotic pressure, which can be determined by an estimation of the serum proteins. Factors are known whereby the percentages of albumin and globulin can be accurately translated into osmotic pressure as millimeters of mercury but the simple protein percentages are adequate for practical clinical use. The physician who is unaware of the necessity of such information in the treatment of edema, wherever it appears, is liable to many confused interpretations of his inadequate data. We shall return to this phase of edema when discussing nephrosis.

The hydrostatic pressure in the capillary is difficult to determine experimentally and almost impossible clinically. The nearest approach at the bedside is by means of inference based on the venous pressure. Although this may be on some occasions an ill-justified inference, particularly when the venous pressure is normal, nevertheless, few cases of edema can be thoroughly appraised without it.

Another important factor in the causation of edema is the state of the capillary wall. It is well-known that localized edemas such as those due to trauma, inflammation, or toxins are dependent upon an increase in the capillary pores with the consequence that an abnormal escape of plasma is permitted. Although this mechanism of edema formation is easily studied experimentally when it is due to local or external causes, its role in general diseases, such as acute nephritis, is quite speculative and cer-

tainly lacking in well-proved facts. It has been assumed, with obvious justification, that edema fluid formed by the seepage of plasma through an overly permeable capillary membrane would have a higher protein content than that accumulating because of an alteration of the pressure relationships across a normal vessel wall. This assumption has been confirmed by analysis of the protein content of fluids accumulating in many types of experimental edema. When the underlying cause is a low osmotic pressure, the protein concentration is small, around 0/1 per cent, but when the edema is produced by capillary poisons, such as histamine, it is rich in protein (1/0 per cent). The application of these facts to the study of certain types of nephritis will be mentioned later.

The varying elasticity or resistance of the body tissues has a determining effect on the location and rate of edema formation. In chronic edema this tissue resistance may be decreased and hence edema is produced more easily.

Anoxemia probably contributes its share in the tendency to edema by its effect on the capillary wall. Although the dilatation that is part of this reaction would cause a drop in pressure, the dilated vessel would tend to become more permeable to protein. Indeed, rarely does a single mechanism of edema formation act without secondary effects which tend to set off one or more of the other basic factors. The result is a complicated interrelationship of forces with the development of several vicious cycles.

Renal function cannot be ignored in discussing the causes of edema since the removal of water by the kidney is one of its important contributions. It is quite possible to cause edema by forcing fluids on a patient anuric from mercurial poisoning or on an uremic patient whose kidneys are badly damaged by nephritis. In the latter instance there may remain an inadequate number of glomeruli to handle a large intake of water. It is possible that in acute nephritis renal ischemia may contribute to the tendency to edema.

The influence of various salts, particularly sodium chloride, on edema has been long known to students in this field. Due to easier analytic methods, chlorine was at first thought to be not only more significant than sodium but a primary cause of edema. Years later, Blum's work made it evident that sodium was the essential element, in fact he proved that other chlorides such as calcium or ammonium chloride had an exactly opposite effect upon the edematous patient from sodium chloride,

causing diuresis instead of water retention. Blum considered the influence of sodium on edema to be a specific ion effect.

Loeb and I have conducted electrolyte balance studies which lead us to believe that no such specific effect exists. Comparative observations of the effect of sodium upon a normal man on a salt poor diet and upon a nephrotic patient made it apparent that there was no qualitative difference between the results in the two individuals. Both retained sodium and water, the nephrotic individual with his disturbed osmotic equilibrium, retained a great deal more, of course, but the general physiological effect of sodium on his total water balance demonstrated nothing that could be called a specific ion effect.

If one assumes, and it is obviously true, that no extracellular fluids can exist in the body unless they contain a certain concentration of sodium, then no increase in these fluids can take place unless more sodium is available. It is apparent, therefore, that restriction of the amount of sodium in the diet of an individual with a tendency to develop edema will be a limiting force on its accumulation. Conversely, an excess of sodium will accelerate edema formation, when the basic equilibria are already altered in that direction. The essential influence, then, of sodium and its salts is a nonspecific one. No one can deny that there exist in the literature of this subject, many instances of salt effects that seem to fall outside this simple concept but they are merely evidences that the unexplored area is still large. They do not preclude in any way, the conclusion that sodium restriction is a fundamental therapeutic measure wherever the general tendency to edema exists.

We may now turn to a consideration of the various types of Bright's disease and analyze them for the mechanisms which I have outlined in the foregoing discussion. The most difficult and unsatisfactory type is acute nephritis. The sudden onset of this type of edema and its wide distribution have led many clinicians to suggest that capillary damage of some unknown origin must be the basic disturbance. Although there is no histological support for this idea, there is other confirmatory evidence. Most important is the high protein content of the edema fluid in acute nephritis as reported by various workers. I stated a few moments ago, that the damaged capillary allows plasma protein to seep through its walls and that it was conceivable that the amount of protein in edema fluid may constitute a gross index of capillary damage. Therefore, since the protein content of edema fluid is high in acute nephritis, it has been

assumed that the capillaries are in some way abnormal. This view, though widely held, has no direct therapeutic implication because the capillary poison has never been identified.

Another hypothesis concerning the edema of acute nephritis holds that there are profound changes in capillary blood pressure, i.e., the physical pressure. Direct measurements have given varying results and are most unsatisfactory because of the crudeness of the methods. It is true that the arterial pressure is often elevated and we have been interested at the Presbyterian Hospital to find the venous pressure, also, above normal on several occasions. Further study is indicated. It is possible that more frequent venous pressure observations might lead to a better understanding of this type of edema. Cardiac support would certainly have to be considered in the presence of a rising venous pressure, and one might be able to forestall the acute cardiac failure seen occasionally in this disease.

The brightest spot in this analysis of the causes of edema in Bright's disease is found when we turn to the nephrotic syndrome. Under this heading are included true or lipoid nephrosis, the nephrotic stage of chronic glomerular nephritis and amyloidosis of the kidney. The most obvious cause of the edema that is so characteristic of these diseases is a lowered plasma osmotic pressure due to a striking decrease in serum albumin. Although Richard Bright over 100 years ago pointed out that the plasma in nephritis is often poor in protein, it was Epstein in 1917 who first called attention to the clinical application of the Starling hypothesis. Epstein showed that a low serum protein implied a lowered osmotic pressure and that thereby the equilibrium between capillary blood pressure and plasma osmotic pressure was altered in a direction that would further the collection of fluid in the tissue spaces. It was subsequently proved that this decrease in serum protein is almost exclusively in the albumin fraction so that the normal albumin-globulin ratio is reversed. Since the albumin molecule is much smaller than the various globulin molecules, it exerts a proportionately higher osmotic pressure, consequently, its loss from the blood stream causes an even more serious diminution in plasma osmotic pressure than was suspected from the originally observed decrease in total protein. Further confirmation of this concept is found in the fact that only a small amount of protein appears in edema fluid from this group of cases, an observation which seems to indicate a relatively intact capillary wall.

There can be no doubt that lowered osmotic pressure plays an important role in the production of edema in the nephrotic individual. Omission, therefore, of careful determinations of this constituent from the clinical appraisal of such individuals with edema or indeed any patient with edema is excusable solely on the basis of total lack of laboratory facilities. We cannot by any known method stop the forces decreasing the serum albumin in these cases, hence, the rational therapeutic indication in the nephrotic type of edema is restoration of the osmotic pressure of the blood. No satisfactory method for doing this by increasing the plasma proteins is yet available. High protein diets have been disappointing as far as elevation of the serum protein levels is concerned, but it is obvious that the great loss of albumin in the urine requires a more than average protein intake. Certainly protein restriction is most unwise. In the usual case, 100 gms. of protein a day will maintain a positive nitrogen balance. An effort to add to the protein content of the blood by transfusions is expensive and the benefits are not at all spectacular. It is not a therapy to be summarily discarded but it is usually rather disappointing.

Another rational method of raising the osmotic pressure would be the infusion into the blood stream of a substance whose molecules were so large that they could not pass through the capillary wall. They would thus exert osmotic pressure in the same fashion as do the plasma proteins themselves. Gum acacia is such a substance and its use does cause diuresis, although not in every instance. Recent work by Lepore seems to indicate that the chief effect of gum acacia is to increase the blood volume and this author believes that the diuresis follows an increased glomerular filtration derived therefrom. Lepore suggests the use of 500 cc. of 6 per cent acacia in normal saline on three successive days. It is only fair to add that some workers report severe reactions to these acacia treatments.

As we turn from our discussion of the nephrotic type of edema, it is necessary to add that although a lowered osmotic pressure is the chief etiological mechanism and the only accurately measurable one, nevertheless, any clinician experienced in this field has seen instances of a wide discrepancy between the serum albumin levels and edema accumulation or diuresis. These situations remain unexplained.

Chronic glomerular nephritis often reaches the uremic or pre-uremic stage without edema formation, in fact dehydration is a more common complication in severe uremia. When it does appear, however, it may be the resultant of several mechanisms occurring separately or in various

combinations. It is rarely massive or extensive.

A decreased plasma osmotic pressure may occur in the uremic stage of chronic glomerular nephritis, and its degree of disturbance be appraised by a study of the serum proteins. A low serum albumin is occasionally the residue of a preceding nephrotic stage. On the other hand, it may be in part the result of malnutrition due to anorexia or vomiting. Rarely, however, does the fall in protein content from either cause reach levels at which edema formation is inevitable. Another common factor is circulatory failure. Cardiac hypertrophy and insufficiency often appear in the terminal stages of chronic nephritis. The consequent venous congestion raises the capillary blood pressure and edema results. Direct study of the venous pressure throws light on this type of pathological physiology. Digitalis and rest as in any cardiac insufficiency are indicated here. Severe anemia may complicate the uremic state and add its not too well comprehended effect, possibly anoxemic, in the direction of edema formation. Transfusion will help the anemia and also be of some benefit to the plasma protein levels. However, if cardiac failure exists, transfusions must, of course, be ordered with some caution.

It is apparent from the foregoing discussion that each type of Bright's disease must be carefully appraised in order to determine the mechanisms which are producing the edema existing in that particular case. The rational therapy applicable to each mechanism is derived from these physiological indications.

In addition to this specific therapy, there are a few general principles that obtain in the treatment of any form of edema. Foremost among these is sodium restriction. Even before edema accumulates in large enough quantities to cause any subjective reactions in the patient, it is advisable to institute a rigidly salt-poor regime. Practically, this means the preparation of all foods without salt and the avoidance of medications containing sodium chloride or bicarbonate. Not infrequently a patient on such a regime is discovered using a saline mouth wash or bicarbonate tablets for dyspepsia. The so-called salt substitutes are of little value as condiments and usually are sodium salts of some organic acid. Potassium chloride in a shaker has been recommended but most patients refuse it. Water restriction is of less value, but it is wise to keep total fluids down to 1500 cc. This is particularly true when cardiac insufficiency plays a role.

It is often necessary to stimulate the elimination of edema before the

underlying disease process has yielded to treatment or has run its natural course. Although there is rarely any place for this approach in acute nephritis, it is at times of real benefit in the nephrotic syndrome. This leads us to a discussion of the diuretics. It may be stated in general that when a diuretic is successful in producing a large flow of urine it is rarely harmful and it is equally true that continued administration without such effect is disturbing to the patient and indeed may be dangerous!

The most innocuous diuretics are found in the so-called saline group, consisting of calcium, ammonium and potassium chlorides or nitrites. They may react poorly upon the stomach and in the presence of severe renal insufficiency may produce rapid acidosis, but usually can be taken over long periods without trouble. This applies particularly to the calcium and ammonium salts. Unfortunately, they do not always stimulate urinary output. The usual dosage of ammonium or calcium chloride is 5 to 10 grams a day. Another harmless but less successful diuretic is urea. It is given in doses of 15 grams three times a day. Theocin and diuretin are examples of another group—they too are harmless but not very potent.

The mercurial diuretics such as salyrgan or mercupurin have the highest percentage of successful results, both as to the number of individuals responding and the amount of urine excreted following administration of the drug. Use of these drugs subsequent to a few days of ammonium chloride ingestion, produces a much larger diuresis than either the saline or the mercurial alone. The benefit of the salt usually appears after there is a moderate drop in the blood carbon dioxide, such as 5 to 10 vol. per cent. A typical diuretic course of ammonium chloride and mercupurin consists of four days of daily 6 to 8 gm. doses of ammonium chloride followed by 1 cc. (or if glomerulonephritis exists only 0/5 cc.) of mercupurin intravenously. If this is not successful the ammonium chloride should be continued and in two days 2 cc. of mercupurin injected. If there is a striking diuresis one can continue the ammonium chloride indefinitely with mercupurin every five to seven days, until the edema has disappeared. If the first dose in glomerular nephritis is unsuccessful, the use of mercupurin should be discontinued. Urine examinations should be made every two or three days for the appearance of an increase in red blood cells. Mercupurin has been successfully used in the form of rectal suppositories. Although I have used mercurial diuretics without harm in true nephrosis, I have hesitated to give it in the nephrotic stage of chronic glomerular nephritis, where the kidneys are

presumably in a state of subacute inflammation. However, other workers have done so, particularly in children, with no apparent harm—although the estimation of such harm would be difficult unless it were very severe. I would advise strongly against the use of this type of diuretic in patients who show evidence of decreased renal function.

Sweating, purging and colon irrigations are therapeutic procedures of real detriment to the general condition of the patient and moreover are far afield from the basic problem. Hence we feel that they have no place in the treatment of Bright's disease in any of its various forms.

It is apparent as I conclude this discussion that there has developed in recent years a gratifying array of knowledge concerning the various types of Bright's disease. But it is also clear that there are many hazy areas and much more yet to be learned. We have just scratched the surface, indeed we have not even done that in the field of basic etiology. It is all the more necessary, therefore, to be meticulous and energetic students of such facts as are contemporarily available.

MANAGEMENT OF TUMORS OF THE KIDNEY AND URETER*

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THE purpose of this paper is to discuss briefly the natural history, clinical findings, and treatment of the three most common types of kidney tumors, namely, Wilms' embryonal adenosarcomas, tumors of the parenchyma in adults, and papillomas and epidermoid carcinomas of the pelvis and ureter. Probably the end results following the treatment of renal tumors have shown less improvement than has occurred in any other diseases of the genito-urinary organs. In spite of many brilliant advances in the practice of urology the fate of the patient with a kidney tumor today is little better than it was twenty years ago. These tumors are characterized by their "silent" development. The greater part of their life history can take place without the production of any symptoms. When they do arise, the symptoms may not appear urgent. Physical findings are rarely pathognomonic and if the majority of cardinal diagnostic signs are present the disease is usually far advanced and often uncontrollable with present methods.

The difficulties of the problem should stimulate physicians to greater alertness in discovering these tumors in earlier stages and applying the best treatment promptly. The laity should be taught the value of periodic physical examinations and the advisability of consulting their physicians without delay if symptoms occur.

Wilms' embryonal adenosarcomas are congenital mixed tumors of the kidney anlage. The average age when this tumor first appears is about three years, although it has been found in the seven months fetus and has affected adults. It is exceedingly rare after the age of seven years. Studies of the tumors of childhood show Wilms' tumors to be second in frequency only to tumors of the eye. Without doubt they are the most common tumors of the genito-urinary tract.

It is impossible to discuss the extensive literature concerning the

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Delivered November 11, 1937, in the Tenth Annual Graduate Fortnight

genesis of Wilms' tumors. It seems reasonable to suppose, however, that since these tumors may vary so markedly in the degree of differentiation of their component cells and in the number of tissues represented, they probably originate at different developmental periods of the embryo.

Wilms' tumors may be located in any part of the kidney parenchyma although the lower half of the organ seems to be involved most frequently in contrast to Grawitz tumors in the adult. The growth is always within the renal capsule unless the capsule has been ruptured. The encapsulation of Wilms' tumors has often been emphasized. It so completely separates the tumor from the renal parenchyma that the growth is described as being "in" the kidney but not "of" it. That portion of the kidney which is not destroyed may maintain its usual shape but it looks like a cap fitting on the tumor.

Wilms' tumors usually remain within the renal capsule until they reach a huge size. After the capsule is ruptured they grow aggressively by direct extension. From the retroperitoneal tissues adjacent to the kidney they spread to the omentum and nearby organs of the peritoneal cavity and may affect all the abdominal viscera. The walls of large blood vessels, especially veins, and the ureters have been destroyed. Even the diaphragm offers only slight obstruction.

The veins within the tumor are large and their walls are thin and fragile. Frequently they rupture spontaneously and often they are invaded by tumor cells. As a result, although extension does take place through lymphatics, the earliest demonstrable metastases are blood-borne and are found in the lungs and brain.

As the tumor grows in the infant there is a gradual distention of the abdomen accompanied by constipation and malaise. After a time, quite by accident in the majority of cases, a mass is discovered in one side of the abdomen. If growth is not stopped it is usually not long before there is a sudden augmentation of symptoms such as vomiting, loss of weight, asthenia, anorexia, increased rate of tumor growth, and the appearance of tortuous, dilated, superficial veins. It is of only academic interest that soon ascites is present, emaciation becomes marked, the abdomen enlarges tremendously, and probably metastases become obvious. Death follows from cachexia or intercurrent disease.

The first symptom in our twenty-four patients was:

1) accidental discovery of a mass in the abdomen, 64 per cent
2) pain in the loin or abdomen 16 " "

3) asthenia and malaise	12 per cent
4) hematuria	4 " "
5) frequency of urination	4 " "

Hematuria, usually unaccompanied by pain, is noted in between 10 and 25 per cent of children with Wilms' tumors. This is in contrast to the much greater incidence of 75 to 85 per cent found in adults with parenchymal tumors. The difference can largely be accounted for by the encapsulation of Wilms' tumors. Not infrequently the bleeding is from the congested parenchyma of the kidney rather than from the tumor proper. Hematuria is always intermittent and recurs at irregular intervals. The blood is diffused throughout all of the voided urine.

Pain is seldom an important symptom. It may be colicky, associated with constipation, or it may occur when the rapidly growing tumor exerts tension on the renal capsule or traction on adjacent organs. In babies this pain is difficult to evaluate.

Urinary signs are usually insignificant and unimportant. This again is probably due to the separation of the tumor by its capsule from the renal pelvis and parenchyma. Erythrocytes are sometimes found on microscopic examination but normal bladder urine may be found many times especially when the diseased kidney does not function because of pressure atrophy. Urinalysis may aid in detecting the onset of infection, and the appearance of albuminuria is noteworthy when it follows pressure on the tumor.

A palpable tumor is a most important observation in either a child or an adult, but in a child it may be the only diagnostic sign. There may be great difficulty in feeling the tumor if the child is obese. Also in young children the kidney normally lies deeper in the pelvis than in adults, sometimes extending as low as the crest of the ilium. Careful bimanual palpation of a Wilms' tumor may demonstrate its location, size, shape, consistence, mobility, and tenderness to pressure. The surface is usually smooth, although in later stages it may be lobulated. When necrosis occurs or hemorrhage takes place into its substance the tumor may feel as soft as in hydronephrosis. Mobility largely depends on the amount of available space remaining in the abdomen because primary tumors are seldom adherent and usually move with respiration.

Because the most careful general physical examination can not prove the presence of a Wilms' tumor and because at the time a suspicious mass is discovered the disease is far advanced, other diagnostic measures

must be carried out without delay. In most cases excretory pyelography will show what appears to be an enlarged kidney with characteristic pressure deformities of the pelvis and calyces. However, poor function or complete obliteration of the pelvis and calyces may render this test unsatisfactory. At this time, if not before, the patient should be referred to a urologist. It should be common medical knowledge, unfortunately it is not, that a complete cystoscopic examination with ureteral catheterization can be performed with little difficulty on the youngest infant of either sex. These procedures with retrograde pyelography should be sufficient to establish the diagnosis and determine the function of the opposite kidney. Under no circumstance should the tumor be incised to obtain material for a microscopic examination. This ill-chosen operation destroys the capsule of the tumor and permits more rapid and widespread growth.

Until recently surgery alone was employed in the treatment of Wilms' tumors and the results were bad. No figures are available, but it is questionable if 1 per cent of the patients survived five years. Principally because of their embryonal nature but also because they had other characteristics in common with tumors whose high radiosensitivity had been proved, radiation was first applied to Wilms' tumors about fifteen years ago. Although the patients were few and the disease in all was hopelessly advanced such marked regressions were observed that the recommendation was made that all Wilms' tumors which had not spread beyond the kidney should be irradiated and removed. If metastasis had occurred irradiation alone should be used. The recommendations concerning nephrectomy are now withdrawn. Personal experiences and those of others have shown that even after sufficient irradiation has been given to cause disappearance of the tumor and an apparently complete nephrectomy has been performed, local recurrences or metastases usually follow. Furthermore, microscopic examinations of the irradiated tumors showed a considerable amount of apparently unaffected tumor tissue remaining. It became evident that either not enough irradiation had been given or the tumors had been removed too soon for full irradiation effects to have become established. On the other hand if sufficient irradiation can be given to cause complete disappearance of the tumor and enough time elapses for cellular devitalization to take place, why operate? Therefore we now treat Wilms' tumors in whatever stage they may be with irradiation alone and the results so far are better.

The region to be treated extends from the anterior midline to the posterior midline of the body on the side containing the tumor. Four portals are outlined in this area. The width of each portal is one-fourth of the semicircumference of the infant's body over the tumor and the length of each is the distance from the upper to the lower ends of the tumor. In practice the portals are about ten by five centimeters in size. Using the 200 kilovolt Roentgen-ray unit at fifty centimeters' distance with one-half millimeter of copper and one millimeter of aluminum as filters 200 *r* may be given daily to a single portal.

In the majority of cases regression can be observed in a few days and it may be so rapid that a large tumor will disappear in two weeks. When the tumor has definitely become smaller the daily dose should be reduced to 100 *r*, an amount which can usually be well tolerated until treatment is completed. Since the minimum dose required to control these tumors is unknown, irradiation is continued to full skin tolerance. Using the portals in turn it is possible to give 3,000 *r* to each without producing more than an erythema in the skin. In a three year old infant of average size this treatment will deliver about seven threshold erythema doses to the region of the renal pedicle.

The greatest care must be observed when irradiating young children because they are relatively intolerant to the agent. The diet should be carefully chosen to maintain general health and blood of high quality. An examination should precede each daily treatment. Blood counts should be made at three-day intervals and roentgenograms of the chest should be taken every two weeks for the first few months. Excretory pyelograms made every two to three weeks will usually show the amount of tumor regression. Should the patient become anemic or the white blood cells fall below 2,000 per cubic millimeter, transfusions are indicated.

The writer realizes that it may seem quite radical to eliminate surgery completely in favor of irradiation in all cases of Wilms' tumors. However, no one can question the fact that the primary tumors markedly shrink under irradiation. For this reason and because radiation is now widely available the time has passed for any surgeon to attempt the removal of a growth weighing one-fourth or more of a child's entire body weight, nor is it necessary to use the more hazardous transperitoneal approach.

A preoperative cycle of irradiation can be given by using the same

factors described above except that the use of three portals rather than four saves time. No attempt is made to give a definite total quantity of radiation because nephrectomy is performed when the tumor has regressed to approximately the size of a normal kidney. In operating the greatest care must be taken to avoid rupturing the tumor capsule because if any of the growth spills into the wound prompt local recurrence is the rule.

Metastases should be irradiated with fractional doses applied through as many portals as the affected part of the body permits. Secondary deposits which can be discovered, such as those in the lungs, will often disappear under treatment, but in our experience the patients succumb to other metastases, usually in the brain, which were undetected until late symptoms such as convulsions or paralysis occurred.

No comprehensive study of the end results of radiation therapy in Wilms' tumors has been made because, to my knowledge only two primary operable patients have been treated with irradiation alone. Each is a healthy, growing child without demonstrable evidence of disease, one fourteen months and the other four years after treatment was started.

Between the ages of seven and forty years, kidney tumors are extremely rare. The great majority of adult tumors occur in patients between forty and sixty, with fifty-two years the average age of greatest frequency.

There are several histologically different tumors of the renal parenchyma in adults. At present their etiology is obscure. We will discuss only the most common, which are adenocarcinomas originating from the epithelium of renal tubules. Clear celled and granular celled varieties are commonly described but beyond the fact that clear celled tumors are more likely to be single, encapsulated, orange in color, and hemorrhagic, while granular celled tumors are more frequently multiple, non-encapsulated, white, more cellular and less vascular, the clinical differences are unimportant. The tumor begins in some portion of the parenchyma, either the cortex or the medulla, and grows by expansion and infiltration. It seems to be a characteristic of these tumors to grow toward the pelvis and penetrate it. When this occurs hematuria follows. From the pelvis the growth may steadily continue down the ureter for a considerable distance, but it does not give rise to secondary tumors in either the ureter or bladder. The renal capsule is a natural barrier, but the unchecked tumor is likely to destroy it after a time and extend widely in the perirenal

tissues. While encapsulation of adult tumors is not unknown, it is rare compared with the regularity of encapsulation of Wilms' tumors. Principally for this reason the symptoms of embryonal and adult tumors are different. However in most cases no symptoms arise for a considerable time. In these adult tumors the walls of the blood vessels are thin and friable. They often rupture spontaneously with the production of hemorrhagic infarcts and areas of necrosis. Tumor cells frequently perforate the delicate walls of the vessels and may break away and travel through veins to set up secondary deposits in the lungs, liver, brain, or bones. Sometimes a solid extension of the tumor grows through the renal vein into the vena cava and even to the heart.

The earliest symptoms are painless hematuria, pain in the kidney region, or discovery of a mass in the upper abdomen. In most cases when the first symptom occurs the disease is well advanced. Not infrequently a patient, unaware of any kidney trouble, seeks relief because of a metastasis. Varicoceles occurring in middle age should arouse one's suspicion of a retroperitoneal growth which may press upon a spermatic vein or occlude the opening of the left spermatic vein by an intravenous extension.

Painless hematuria is the initial symptom in about 70 per cent of all cases. Bleeding occurs at some time in the course of about 90 per cent. The blood, characteristic of all renal bleeding, is diffused throughout the entire specimen of urine. If the hemorrhage is profuse, clots may form in the ureter or bladder and give rise to ureteral colic or dysuria. Cylindrical blood casts of the ureter are of considerable diagnostic significance. In all cases hematuria is intermittent and may not recur for months.

While the sudden appearance of bloody urine is a severe shock to most persons, as soon as bleeding stops without other symptoms arising their equanimity is only too easily restored, especially when relief coincides with the administration of a urinary antiseptic and a physician's assurance that "a bit of gravel must have passed." It can not be too strongly emphasized that hematuria always indicates organic disease somewhere in the genito-urinary tract and no efforts should be spared to discover the place of its origin and the cause.

Pain is much less frequent as an initial symptom, but in the majority of patients it occurs at some stage of the disease. Pain in the kidney region is usually due to tension on the renal capsule. It may come on suddenly with the occurrence of a hemorrhage into the tumor substance. This type

of pain usually subsides. However, pain in the kidney region which steadily becomes more severe suggests extension of the disease beyond the capsule, perhaps with nerve involvement.

In most cases when hematuria or pain occur an enlarged kidney can be palpated, although if the tumor involves the upper pole this may be impossible.

A minority of perhaps 15 per cent of patients seek advice for progressive loss of weight and strength and a kidney tumor is discovered. In this group prognosis is especially bad because the tumor has perforated the renal capsule before growing into the pelvis and an extensive extrarenal growth has developed without giving rise to any localizing symptoms.

While a careful general physical examination is essential, a detailed study of the tumor can be made only by following urological methods. Whenever possible one should demonstrate the type of the tumor, the separate function of each kidney especially the sound one, whether or not the primary tumor has grown through the renal capsule, and the location and extent of possible metastases.

Excretory pyelography may furnish helpful information but in general the test has proved of less value than had been hoped. Cystoscopy with bilateral ureteral catheterization, dye elimination, urea clearance tests, and retrograde pyelography give the greatest information. In a few cases perirenal insufflation may show that the renal capsule has been ruptured. The function of the diseased kidney is a matter of great possible variation and of but slight importance. Whether or not the opposite kidney alone can maintain life must be known.

The interpretation of retrograde pyelograms is sometimes exceedingly difficult. The tumor may press on the pelvic region so firmly that no contrast medium can be seen or faint traces can be visualized only when the Roentgen rays strike the injected fluid tangentially. Greater difficulties are present when the changes are least marked. In general parenchymal tumors cause alterations in size and shape, often forcing the kidney out of its normal position and pressing on the pelvis and calyces to cause bizarre filling defects in certain calyces and elongation of others.

With radiation therapy emphasizing the importance of knowing the cellular composition of tumors before treatment is given, attempts have been made to obtain a preoperative diagnosis of the structure of renal tu-

mors. Of course full advantage could be taken of this information only if successful specific therapy were available. As yet neither diagnostic nor therapeutic measures are sufficiently refined. However, within the past two or three years aspiration biopsies have been performed on kidney tumors. The method, in general, is the same as for the aspiration of tumors in other locations, described by various workers in the Memorial Hospital. With the patient lying prone with a pillow under the abdomen the tumor is located by its relation to bony landmarks in the roentgenogram compared with those on the body. After suitable skin preparation and anesthetization a long eighteen-gauge needle is inserted until the external end moves with respiration. This indicates that the point is in the kidney. Negative pressure is exerted with a tightly fitting syringe while the kidney is probed. The needle is then withdrawn and whatever tissue it contains is blown out on a glass slide, spread with another slide, fixed, and stained. The entire process requires less than ten minutes. Tissue should be easily obtained from every parenchymal tumor. A competent pathologist, given tissue, can state with assurance whether or not tumor cells are present but he cannot, in all cases, determine the type of tumor. The test helps little in predicting the tumor's radiosensitivity because that must be determined largely by trial and it is of no prognostic value since prognosis depends on factors other than structure.

Nephrectomy is the only treatment which can control tumors of the renal parenchyma in adults. The operation should be performed in all cases unless the patient's general condition is bad, the function of the opposite kidney is insufficient to maintain life, or the disease has spread beyond the kidney either by local extension through the capsule or by distant metastases.

Study of the end results of the surgical management of tumors of the renal parenchyma in adults reported by a number of observers indicates that about 25 per cent are inoperable when first seen, the mortality of nephrectomy varies between 15 and 30 per cent, and about 15 per cent of the patients are well after five years.

While the unqualified statement that radiation should play an important part in the management of all Wilms' tumors seems justified, the writer believes that as yet radiation has proved of slight clinical value in the treatment of renal adenocarcinomas. This opinion unfortunately conflicts with a number of highly optimistic reports in the literature. Under irradiation a large majority of these tumors shrink. This regres-

sion in size has been the principal reason for the assertion that the tumors are radiosensitive. However, examinations made after nephrectomy show that the principal demonstrable change consists in injury to the thin walled blood vessels with the production of infarcts. While a considerable amount of tumor tissue is undoubtedly devitalized within the infarcts, yet apparently unchanged tumor cells can be found in immediately adjoining areas. Furthermore, it is difficult to determine how much value to attribute to irradiation because, as we have seen, infarcts occur spontaneously in these tumors and even with the microscope one cannot clearly differentiate spontaneous infarcts from those produced by irradiation.

The writer believes that the following conclusions represent a fair estimate of the proved value of radiation in the treatment of these adult tumors:

1. Radiation alone cannot control the tumors.

2. Preoperative irradiation will diminish the size of the majority of the tumors. This may facilitate nephrectomy. The value of irradiation in these cases is approximately equal to partial removal of the tumor.

3. Irradiation will not make an inoperable tumor operable. A tumor is considered inoperable when it has perforated the renal capsule and invaded the perirenal tissues. Large size alone does not constitute inoperability because the surgeon's skill is an important factor.

4. If tumor cells are disseminated by the unavoidable trauma of a skilfully performed nephrectomy, and this has not been proved, a preoperative cycle of radiation probably cannot prevent the disaster.

5. During the course of a preoperative cycle of radiation and the period of waiting for its effects to become established and regeneration of the superficial tissues to take place, metastasis may occur.

6. If a tumor recurs locally, even though the recurrence appears superficial, external irradiation may diminish its rate of growth but will not stop it.

7. Metastases from renal adenocarcinomas show great differences in radiosensitivity depending on their location. Secondary deposits in the lungs frequently disappear while those in bones are inhibited slightly, if at all.

The following factors have furnished satisfactory preoperative irradiation: the 200 kilovolt unit, filtration by two millimeters of copper, a target skin distance of seventy centimeters, and anterior, lateral, and

posterior portals, each about fourteen by ten centimeters in size. A single portal is given 250 *r* daily until each has received 2,500 *r*. This treatment requires about a month and delivers to the region of the renal pedicle about five threshold erythema doses in a man of 150 pounds (68.2 kg.) weight. After studying the radiation required to control other tumors, for there is no definite information regarding renal adenocarcinomas, it seems reasonable to believe that this amount is somewhat less than one-half of a curative dose. In most cases there is superficial blistering of the skin but healing is complete in about six weeks. At the end of this time, or two and one-half months after irradiation was started, nephrectomy can be performed with little if any noticeable delay in healing.

An inoperable kidney tumor should always be irradiated because nothing else is of the slightest help and the palliative effects of radiation are often considerable. In these cases maximal doses should be given and it is not as important to keep within a time limit or to preserve the skin so carefully. Four portals are used, each about fourteen by ten centimeters in size, the other factors remaining the same as in the preoperative cycle. With an additional portal greater skin regeneration takes place between treatments and it is often possible to give 3,000 *r* or even more to each portal. This furnishes about seven threshold erythema doses to the pedicle region of a man weighing about 150 pounds.

While these doses of radiation are well tolerated by most adults all patients should be carefully observed. The quality of the blood must be kept high because anemic individuals probably respond less favorably to irradiation. A diet rich in liver or liver extracts is helpful but transfusions of whole blood are best.

Papillomas and epidermoid carcinomas of the renal pelvis and ureter have the same structure and growth characteristics as epithelial tumors of the bladder. Little more is known about their etiology than that of the other kidney tumors. Chronic irritation by calculi seems to precede a definite number of epidermoid carcinomas and the changes between chronic productive inflammation through leucoplakia to clearly demonstrable cancers have been followed in several studies. Infection, always present with large calculi, may play some etiological part, but how much is uncertain. Other factors, still unknown, must be even more important because, while it is possible in a number of stone cases of long duration to find tumors in about 20 per cent, no antecedent history of stones can be obtained in between 75 and 90 per cent of tumors.

The papillomas, of a relatively low grade of malignancy, gradually spread from their usual place of origin in the pelvis down the ureter and into the bladder. Perhaps the condition is a disease of the mucous membrane of the entire urinary tract. At any rate it may become widespread and there is frequent recurrence on the opposite side. It has been suggested but not proved that the etiological factor is some carcinogenic substance eliminated through the kidneys.

The first symptom of papillomatosis is usually hematuria. This may not occur until the disease has spread as far as the bladder and the bladder tumors bleed. The hematuria is intermittent and usually painless. It is likely that erythrocytes are present in the urine for several months before frank bleeding occurs but they are rarely discovered because routine urinalyses are too seldom made.

Obstruction at the ureteropelvic junction and infection are regularly present even in early cases and either may cause vague sensations of discomfort in the kidney region or temperature elevations. There are no localizing symptoms in most cases, possibly because changes in the kidney are gradual and they are accompanied by progressive destruction of function.

Diagnosis is usually established by retrograde pyelograms although catheterization of an obstructed ureter is sometimes difficult. Excretory pyelograms are usually unsatisfactory owing to diminished function. Discovery of a papilloma in or near a ureteral orifice should always arouse suspicion concerning its possible origin higher up in the urinary tract. When pelvic and ureteral papillomatosis spreads to the bladder mucosa prognosis becomes more grave. Retrograde pyelograms show a striking picture of multiple filling defects in the kidney pelvis and ureteral lumen caused by the many papillary tufts. Usually the calyces are markedly dilated and the parenchyma is correspondingly reduced by pressure atrophy. As soon as this disease has been discovered one must learn not only the function of the opposite kidney but whether or not it is affected with similar growths.

The treatment in all cases should be nephro-ureterectomy. There is a good chance for success because the disease remains for a long time within the urinary tract. Radiation is not recommended because complete tumor regression would be most unlikely and there are no advantages in conservative measures because the function of the kidney has usually been lost.

A two stage operation is advisable for the majority of patients. At the first stage the kidney is removed with about two-thirds of the ureter. About two months later one should excise the ureteral stump with a cuff of the bladder surrounding the ureteral meatus. For the second operation a pararectus incision has been found more convenient than the usual midline approach.

After operation these patients should be carefully followed with cystoscopic examinations performed about every two months for several years. Small papillomas springing up in the bladder can be readily destroyed by fulguration, but if tumors develop in the remaining kidney or ureter no curative treatment is known.

Epidermoid carcinomas of the renal pelvis are fortunately rare. In common with other kidney tumors they usually grow "silently" for a considerable time. The great majority are highly malignant and metastasis through lymphatics has usually occurred before symptoms arise. Cures are exceptional.

The usual initial symptom is painless hematuria, but if the tumor arises close to the ureteropelvic junction vague symptoms of obstruction may occur sooner. While it is often impossible to make an accurate preoperative diagnosis the retrograde pyelogram furnishes the greatest diagnostic aid. In the region of the pelvis there may be a partial filling defect which has strikingly well defined margins due to their dense induration. Simple nephrectomy is the treatment of choice.

Fewer than 100 cases of primary carcinoma of the ureter have been reported. The average age of the patients was about fifty-five years. Chronic irritation seems to play an important etiological role because a large proportion of the tumors have been associated with calculi, leucoplakia, or ureteritis cystica. The tumors are usually of the higher grades of malignancy and metastasize through lymphatics comparatively early. Painless hematuria may be the initial symptom but renal changes caused by obstruction and infection are usually so pronounced that pain in the kidney region accompanied by elevation of temperature may precede bleeding from the tumor. The importance of urological study is demonstrated in patients such as these who have a serious disease with relatively insignificant symptoms. The most careful general physical examination cannot discover the underlying pathology in these cases but a pyeloureterogram will quickly solve the problem. As soon as the diagnosis has been made nephro-ureterectomy should be performed. At the same

time the lymphatics in the perirenal and periureteral fat should be removed. Postoperative irradiation is advisable in all cases of epidermoid carcinoma of the renal pelvis or ureter although its value is as yet uncertain.

Conclusions

1. The "silent" development of renal tumors is largely responsible for poor end-results of their treatment.

2. In recognition of the difficulties of the problem the importance of periodic physical examinations should be stressed.

3. A mass in the kidney region of a child or sudden painless hematuria in an adult is the most frequent initial symptom of a renal tumor.

4. Aspiration biopsies can be safely performed on the kidney but the pathologist should interpret the microscopic picture with full knowledge of the limitations of the method.

5. A kidney tumor in a child should never be incised to obtain histological material.

6. No infant of either sex is too young for a complete urological examination.

7. Wilms' tumors are best treated with radiation alone. All other operable tumors of the kidney or ureter should be managed surgically.

8. The principal effect of irradiation on renal adenocarcinomas seems to be destruction of the delicate walls of blood vessels with the production of hemorrhagic infarcts. Although there is frequently complete destruction of tumor tissue within the infarcted areas one can usually find apparently unchanged cancer cells nearby. The clinical effect of preoperative irradiation in these cases is equivalent to partial removal of the tumor.

9. Since it is unlikely that the results of surgery alone will be materially altered, future improvement in the management of renal tumors will probably follow earlier diagnosis, advances in the use of the physical agents and discovery of other, better, methods of treatment.

THE SIGNIFICANCE OF THE NEW YORK ACADEMY OF MEDICINE*

Presidential Address

JAMES ALEXANDER MILLER

WE HAVE this evening had the privilege of hearing from Doctor Krech a report of the activities of the Committee on Fund-Raising, of which he is chairman. The object of this Committee is to inform the citizens of New York City of the work of the Academy and of its services to the medical profession and to the community as a whole.

The Committee has published a very interesting booklet which contains much information with which probably many even of our own Fellows are unfamiliar and which will repay a careful perusal by all interested in the maintenance of high medical standards and the promotion of better health in New York.

While it is a primary object as well as a hope that this wider dissemination of knowledge concerning the Academy will aid in securing for it a broader base of financial support, at the same time this effort is largely an educational undertaking directed toward a better understanding of the activities and purposes of an important quasi-public institution all too little known to New York and to New Yorkers.

As it is the privilege as well as the duty of the President to address the Academy upon this occasion on some subject of general interest it appears timely to raise the question: What is the real significance of the Academy of Medicine?

Inasmuch as the material for this address is drawn largely from the same sources, it is inevitable that my discussion of this question will parallel in many respects the contents of the descriptive booklet to which allusion has already been made. However, as the approach is from a somewhat different angle, it is hoped that the repetitions which may occur may only add emphasis to important phases of the general subject, and that, in addition, sidelights of interest and value may be afforded.

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* Delivered at the Annual Meeting, January 6, 1938

This pamphlet describing the Academy's activities presents the facts *objectively*. In it will be found in concise and concrete form a summary of what the Academy is doing. It is my purpose to deal with these same facts *subjectively*, that is, in terms of personal reaction to them. In other words, to raise the question as to what is, or may be, the significance of these Academy activities to various groups who are, or, we believe, should be, interested in them. The facts, being objective, may speak for themselves, but, if they are to have influence, they must be understood and interpreted in the consciousness and experience of those to whom they are presented. This is the subjective side of the situation. What is the significance of these facts, their meaning?

For our purpose the numerous individuals whom we wish to enlighten concerning the Academy may be divided into various groups.

I. The members and Fellows of the Academy.
II. Other members of the medical profession.
III. The patients of these physicians.
IV. The Institutions in the city, both public and private, which are organized for the treatment and prevention of disease.
V. The general Community.

I. The Members and Fellows of the Academy

In our effort to interpret the significance of the Academy it appears proper and logical that we begin with that group of us who are members or Fellows of this institution, for, after all, this Academy in some sense belongs to us, or at least the responsibility for its activities is primarily upon our shoulders.

So this evening first of all I am putting to you, the members of the Academy, the searching personal question: What does the Academy mean to you? It may be that you have never posed this question to yourself. If so, will you allow me for a few moments to try to give direction to your thinking?

There are 1700 active resident members and Fellows of the Academy from a total of over 14,000 physicians in the entire city. Why are we among this selected group? If you think that it occurs as a matter of course I wish that you might all know something of the careful deliberations of the Committee on Admissions. You would then recognize that each one of you has been selected because of certain definite attainments in your profession, and perhaps even more because of the promise which

was considered to be in you that you would go on to a greater fulfilment of your possibilities. On that account you were deemed worthy of admission to the privileges which the Academy offers to help you to make that promise good.

Is this an honor? In one sense yes, reflecting as it does the judgment of your own peers. But, is it not still more a responsibility? If so, how far have we lived up to this responsibility?

Look back over the ninety years of the history of this Academy! It is a story of the struggle of eager minds to crystallize the ideals of our profession into an institution which would be a vital instrument for furthering the ideals of a progressive betterment of the profession and of the health of the community. By slow and painful steps a library was gradually accumulated, there was provided a forum for the discussion of medical subjects, a medium for continued medical education, and an opportunity for leadership in the health problems of the city. Now, these things did not happen of themselves, nor were they the spontaneous gifts of an admiring and appreciating public—far from it. They were the result of persistent and strenuous labor on the part of physicians who believed in the Academy and were willing to work, work hard for it. And so finally at last we, as an Academy, have arrived at our present exalted station, ensconced in a setting of beauty, comfort and dignity, endowed with a Library second to none, with an equipment for study and discussion undreamed of by our predecessors, and a staff ready to render every service for which our forbears longed in vain so many years.

Now, do we, the present members, own this great thing which has been set up, have we proprietary rights in it? Are we not rather the temporary legatees of an institution handed down to us by our fathers and by those generous benefactors who were willing to support their ideals? We are but trustees for the nonce, obligated to carry on and in our turn to pass the Academy over to our successors, intact and enhanced in value because of our efforts.

Owners? Why, we do not even pay the carrying charges, to say nothing of the capital invested! We pay our dues, to be sure, but do you realize that their total amount is less than thirty per cent of our annual budget, that we do not even pay for the annual cost of the upkeep of our Library alone?

Our ownership is in a responsibility, not in tangible rights or privileges, and our membership is an obligation, a debt rather than a

recoverable asset.

How can we repay this debt? I would suggest to you that if the Academy means what I would like to think that it does to us, we may do so in at least one of three ways.

1) Payment by better utilization of our privileges.
2) Payment in services.
3) Payment in direct or indirect financial contributions.

I would further suggest that you try not one, but all of these methods of payment. Let us consider each one in brief detail.

1) *Payment by Better Utilization of our Privileges.*—Our first thought here turns to the Library. We all know what a superb instrument for medical education it is. The books, the periodicals, the reference and bibliographical services combine to make its use easy, profitable and pleasant. In it, as members, we have certain minor privileges over the general public, such as a private members' reading room, the opportunity for evening use, and the privilege of withdrawing books.

Last year the Library had over 61,000 readers, of which 8000 were members of the Academy. Does this indicate that we are appreciating and utilizing our opportunities here as we should? Can we not make this wonderful Library mean more to us?

Then there are our meetings for medical discussions and exchange of ideas. Last year there were held seventy-seven meetings of our various eleven Sections, with a total attendance of 11,700, an average of 152 at each meeting—a very creditable evidence that these meetings certainly mean something to our members. The attendance at the Friday afternoon lectures and those held in connection with the Graduate Fortnight is very large. Although the physicians in attendance are predominantly non-members, it is obvious that these meetings are recognized as of real educational value.

The attendance at the regular stated meetings of the Academy is, on the contrary, often disappointing, in spite of the devoted efforts of the Program Committee to make them attractive. Perhaps one reason may be that they are conducted as didactic lectures without opportunity for discussion. Some of our Fellows have suggested this, but it is significant that similar lectures held on Friday afternoon are well attended. Perhaps it might be better if we held our stated meetings in the afternoon instead of in the evening.

This problem of the stated meetings has perplexed the officers of the

Academy for several years. They would welcome suggestions from the membership as to how these meetings can be made to have more value and meaning to the Academy.

In general it may be said that all of these opportunities above outlined are designed for the postgraduate education of physicians. This is the main function of the Academy, and if we all might appreciate and utilize them more, the Academy would certainly mean more to us.

2) *Payment in Services.*—Here is a real opportunity to show what the Academy means to us.

In this connection I wish first of all to stress the work of our Academy committees. More than 200 of our members are each year serving upon one or more of our important committees. We are very proud of this work, and it is a valiant service indeed.

I wish that there were time to expatiate fully upon the amount and character of this committee work. It is second only in importance to our educational activities. Hours of devoted and hard labor is spent by these committees and their numerous subcommittees. This has meant much to the Academy, to the profession and to the community.

These committees help to operate the Academy, they study how to keep up our standards of service and of ethics, they work hard in the interests of the Library, they scrutinize with the greatest care the qualifications for admission to the membership, they plan the programs and study and provide for the varying educational needs, they are intimately concerned with numerous problems of public health and meet the demands for counsel and advice which come to them in ever increasing numbers from all sorts of public and private organizations as well as individuals. In this field of public health service alone the Academy has come to have a commanding position of influence in the community.

Another committee serves our publicity relations, assisting and advising the press in medical matters, giving reliable information to physicians and other citizens, protecting physicians from awkward publicity predicaments and restraining the activities of others to whom publicity is not awkward. This phase of our committee work has been reviewed with great care by the Council during the past year, and while it would appear that some modification of the program is desirable, it is also equally plain that the judgment of our first director, Doctor Linsly R. Williams, was sound and that the Academy cannot shirk the assumption of some responsibility in this field of effort.

The work of our committees in general is magnificent, but only a little more than one-eighth of our total membership shares in it each year. It is our policy to make annual substantial changes in personnel, so as to distribute more widely the opportunity as well as the labor among our membership. Every member should be eager and ready to serve in some capacity for which he may be particularly fitted, and it is hoped that the opportunity may be available for many more members than at present.

A few years ago one of our Fellows, who later was elected to one of the highest offices in the gift of the medical profession and who had at that time served for several years our Committee on Public Health Relations, said in conversation: "Those meetings of the Public Health Committee have meant more to me in widening my horizon and teaching me the responsibility of medicine than anything that I have experienced since leaving the medical school."

This is what that particular committee meant to that man. It means that to many others, and in some form of service it could mean that to each one of you.

3) *Payment through Financial Contributions.*—Now you will perhaps say to yourself that this is what the President has been leading up to, which is not true, although perhaps there may be some truth in it.

The plant and equipment of the Academy is worth conservatively $2,600,000. We have an invested capital worth even at present prices $2,700,000. The income from these investments is at present $158,000 a year. In the main, it is this income which supports the Academy. While this seems like a good deal of money, yet even with careful management and economy it is not sufficient to meet our expenditures without a deficit unless there are additional contributions to our annual income. In addition, we are confronted with pressing needs which can only be met by still larger funds. The details of these needs have already been explained to you. Now what, if anything, are you, the members, intending to do about this? A few months ago we received, in response to a letter which was sent to all members of the Academy, a communication from one of our most valuable members from which I would like to quote.

He said: "I feel very strongly that the Academy is an asset to every one of its Fellows and members. I believe that every one should contribute something toward its deficit, and I am not willing to appeal to any of my well-to-do friends until I am assured that all of the members

of the Academy have subscribed to this fund. For, if the Members and Fellows cannot individually subscribe at least one dollar a year, then I have not the effrontery to approach any of my lay friends."

Now, I have no intention of pressing this particular point. But it is an index of what the Academy means to this particular Fellow, and it is perhaps significant that a favorable response to this preliminary appeal sent out last June was received from 258 members and Fellows, which number very closely corresponds in number as well as in personnel to those individual members who have served upon our Committees. The active workers were the ones most ready to give, the Academy meant more to them. Truly, appreciation best comes through service.

When each one of you comes to think over the Academy in the light of the information which is being put before you as well as in the light of your own experience, will you not ask yourselves the question: Is the Academy worth to me more than forty dollars a year?

I have purposely placed a good deal of stress upon the significance of the Academy to its own members, for it is upon them that the responsibility primarily rests.

We will now proceed to examine the situation as it affects other groups in our community. This may be done in a less exhaustive manner, as much of the material presented will be the same although the application and emphasis will be somewhat different.

II. The Other Members of the Medical Profession

As has already been indicated, there are over 14,000 physicians in this city, of whom only 1700 are active members of the Academy. It is obvious that an institution which pretends to provide opportunities for postgraduate education must offer them freely to all who are qualified as physicians to make use of them. This the Academy does.

The Library, the section and stated meetings, the Friday afternoon lectures and the Graduate Fortnight are all open to any physician. With certain minor restrictions they have the same advantages in the use of these activities that are offered to our own members. We also send free to every physician in the city our publication: "Preventive Medicine."

That these opportunities mean much to these physicians is evidenced by the very considerable numbers which avail themselves of them. There is no doubt that the Academy is regarded as the medical center for all physicians of the city, whether members or not, that it enhances mate-

rially the standards of medical practice and thus materially affects the welfare of the community.

Consciously or unconsciously these outside physicians respect the standards of practice and of ethics for which the Academy stands, and a considerable number of them aspire to eventually being able to join our membership and thus secure the stamp of approval upon their proficiency which such membership would signify to them and to their colleagues.

As our waiting list of applicants for admission grows, and when it becomes obvious that the present limitation of numbers is withholding the privileges of membership from a considerable number of physicians who desire them and are properly qualified, there is little doubt that the Council will decide to increase the membership to meet such legitimate demand. This has been done in the past and can quite well be done again in the future.

In the meantime the Academy will continue to welcome within its doors all serious students of medicine and to render them assistance in their efforts to improve the quality of their work and also to provide for them a standard to which they may aspire.

Thus the Academy has a real significance to the entire local medical profession, which is limited only by the capacity of each and every physician to appreciate it.

III. The Patients of these Physicians

This applies to all physicians, whether members of the Academy or not, and to all patients under their care, whether in hospitals and dispensaries or in private practice.

The main function of the Academy being to help develop better doctors, any progress which is made toward that end becomes immediately a service to the patients under the care of these doctors.

Unfortunately, many patients still choose their medical advisors with less thought and care than they pay to their stock transactions or even to the selection of their tailors or dressmakers. In hospitals and dispensaries they usually have no opportunity for choice at all, but here they are protected by the wisdom and responsibility of various appointing boards who make the selection for them.

Among the private-patient group, however, there is a gradually increasing appreciation of the fact that one's physician may be vitally important in one's life and that proper education and training means

more in a crisis than does an affable bedside manner.

Many people, however, do not realize that the education of the physician is a continuous process through his entire professional life, and that when he ceases to be a student he at that selfsame moment begins to deteriorate professionally and finally to dry up and wither away.

There can be no question that the chief element in this education is experience, properly utilized and interpreted. The most valuable source of this experience comes from the hospitals with their large clinical material and their opportunities for the close study and observation of many cases of disease. With due regard to the tremendous value of the free service thus rendered by physicians in hospitals and dispensaries, I venture to think that the dominating motive which attracts every wide-awake physician to these hospital positions is not primarily humanitarian. That phase of our work we in general assume automatically to be the natural responsibility of our particular profession. Rather it is an irresistible impulse which drives such a physician constantly to strive to improve his medical knowledge and skill.

Granting the predominance of clinical experience in the attainment of graduate medical education, the next most important element is the opportunity for reading and the study of the current literature, so absolutely essential in these days of rapid growth in modern medical knowledge, and also closely connected with this is the opportunity for discussion and the matching of ideas and exchange of opinions with one's colleagues. It is in these phases of medical education that the Academy supplements practical clinical experience, and, as we have above shown, it does it in a very efficient way.

Thus, to all patients, rich and poor alike, the Academy, whether they know it or not, means that they obtain better medical services from the physicians who will avail themselves of these privileges, and that in the last analysis our patients are the ones who are the greatest gainers from the education which the Academy affords.

IV. The Institutions in the City, both Public and Private, which are Organized for the Treatment and Prevention of Disease

By these are meant especially the hospitals and dispensaries with their allied services, on the one hand, and the organizations designed to render preventive services to the public, on the other. In addition, there are certain other public and private organizations not primarily concerned

with health or disease, among whose activities, however, certain health problems necessarily arise from time to time.

The services rendered by the Academy in this category are largely through the activities of its Committee on Public Health Relations. We have already presented a general review of this service. It is difficult to overemphasize the dependence that certain public departments of the city government have come to have upon the advice and assistance of the Public Health Committee. This is especially true of the Health Department, of the Departments of Hospitals and Education, and also of the Civil Service Department. For example, during the past year this Committee has made a comprehensive report upon the organization necessary for determining the early type-diagnosis and the effective serum treatment of pneumonia. Also it has made, in cooperation with the New York Tuberculosis and Health Association, a study of the tuberculosis hospital situation. It has prepared regulations for the examination of medical inspectors in the Department of Education. Many detailed studies conducted at the request of the Department of Health or of Hospitals have been made and, in addition, specific recommendations concerning the items to be contained in the annual budgets of these departments. It has cooperated with the County Medical Society in a study of the possibility of requiring health certification for domestic servants, and in cooperation with the New York Tuberculosis and Health Association a study has been made of the situation regarding tuberculosis as a compensable disease, especially with reference to nurses.

In cooperation with the Medical Information Bureau and the Committee on Medical Education, and upon the request of the Department of Education, there have been formulated plans for a series of lectures for school teachers on matters of health and hygiene, which would help them in the performance of their duties. It has also given assistance to the Civil Service Department in the formulation of examination requirements as well as the securing of competent personnel to conduct such examinations as they apply to medical positions in the various city departments.

These and many other services have been rendered and many reports have been prepared in various phases of the health problems of the city.

The testimony which has been freely offered to us from many sources, and the increasing demand which comes to us for such services, are conclusive evidences of the significance of these activities to many important groups in the city, and it is hardly an overstatement to say that the gradual

development of the work of this Public Health Committee for more than twenty-five years is one of the outstanding achievements of the Academy.

V. The General Community

In and through our entire discussion has run the suggestion that the Academy has a real significance to the community as a whole.

The diffusion of medical knowledge throughout our membership and throughout the entire body of New York physicians, the advantages which thus accrue to thousands of suffering patients by assuring them of better treatment, the services of the Committee on Public Health Relations and the Medical Information Bureau to so many various groups in the population, and finally the general influence of the Academy upon the development of the better practice of remedial and preventive medicine, are all directly of great advantage to the public at large.

It has been suggested by some intelligent but, I believe, ill-informed Fellows that the Academy would do well to confine its activities to strictly medical matters, mainly, if not exclusively, affecting our own membership. It has even been suggested that it would have more dignity and influence if it were possible to restrict these privileges to a much smaller number, perhaps not exceeding five or six hundred Fellows.

Now, I can conceive of the attraction and charm that such a medical Athenaeum Club might have for the elect, but would it meet our responsibilities?

There is another very practical side to this question. During the past year we have been required by the Department of Internal Revenue to show cause why we, as a limited-membership corporation, should be exempt from taxes. A very searching investigation was made which required many months of serious preparation and anxious thought on the part of our Director and of our legal counsel who faced the possibility of our liability to real estate, to capital gains and to income taxes. The result was a complete victory for the Academy, but this was due solely to the substantiated fact that the Academy is rendering an outstanding public service entirely outside of, and outweighing any advantages to, its own members. We cannot afford to lose sight of this situation as we formulate our future program.

But apart from this very important practical consideration there are other compelling reasons of a more strictly medical nature. From the welter of acrimonious discussion concerning medical organization that

has gone on both within and without the profession during the past few years at least one significant fact emerges and that is that the medical profession cannot live to itself alone.

While we quite properly claim the post of leadership in any projected changes, we cannot deny that the community as a whole has also a vital interest in this question. This problem has comparatively little to do with the curative side of medicine, nor, as it seems to me, are the economic factors as predominantly important as they have been made to appear. It is rather the social and preventive aspects of medicine which demand the close cooperation of the profession and of the laity alike. We physicians have been criticized, perhaps with some justice, for having neglected these fields which are now recognized to have become increasingly important. We have been deeply engrossed in our own essential job of trying to take good care of sick people, and it is quite possible that our preoccupation has too closely narrowed our vision of our other responsibilities. But in every field of medicine, whether curative or preventive, it is the quality of service which counts and no change of organization can supply this, for it must come from the better training and education of physicians. The Academy, as already described, has made significant contributions toward this end, and particularly has it served as a center through which has been focused the greater attention of the profession upon this social and preventive side of medicine. In this way we serve physicians and laity alike, and it does not appear thinkable that we can in any way curtail these services, rather it would appear that we must continually extend them. This, in addition to the development of our proficiency in curative medicine, is the basis upon which we have the right to state to the public that we are acting in their interest and thus deserve from them both interest and support.

So, as we now at this time go out before the public with our appeal, let us be sure that our own house is in order, that we, as individual members of the Academy, recognize and appreciate the true significance of the Academy and that this involves not only improving ourselves but also continually serving the community.

As we thus develop our interest in the collateral branches of social and preventive medicine for which the Academy stands, we will be surprised to find how much our own horizon has become widened and that we have unconsciously developed our own capacities as individuals, as citizens and as physicians.

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Stuttgart, Enke, 1937, 282 p.

PROCEEDINGS OF ACADEMY MEETINGS

STATED MEETINGS

FEBRUARY 3—*The New York Academy of Medicine.* Executive session; Reading of the minutes. ¶ Paper of the evening—The conception of cancer before and after Johannes Müller, Howard W. Haggard, Associate Professor of Applied Physiology, Sheffield Scientific School, Yale University. ¶ Report on election of members.

FEBRUARY 17—*The Harvey Society in affiliation with The New York Academy of Medicine.* Fifth Lecture, "Studies on the Cortical Representation of Somatic Sensibility," Philip Bard, Professor of Physiology, The Johns Hopkins School of Medicine.

SECTION MEETINGS

FEBRUARY 1—*Dermatology and Syphilology.* Reading of the minutes. ¶ Presentation of cases—a] Mt. Sinai Hospital; 2] Miscellaneous cases. ¶ Discussion of selected cases. ¶ Executive session.

FEBRUARY 4—*Surgery.* Reading of the minutes. ¶ Presentation of cases—a] Two cases of micro-aerophilic hemolytic streptococcus (shown as a group), John V. Bohrer; Discussion by Frank L. Meleney; b] Two cases of Wescott Nail for intracapsular fracture of neck of femur (shown as a group), Edward R. Easton; Discussion by Clay Ray Murray; c] Incidental findings in gall bladder surgery, Pro. V. Prewitt; Discussion by Henry Horn (by invitation); d] Penetrating ulcer of the stomach, C. Joseph Delaney (by invitation); Discussion by J. William Hinton; e] Dislocation of the cervical vertebrae Philip D. Allen; Discussion by Byron Stookey; f] X-ray diagnosis of prolapse of the gastric mucosa, Benjamin Copleman (by invitation); Discussion by John R. Carty. ¶ Papers of the evening—a] Surgery in alcoholics, George A. Koenig; Discussion by John A. MacLean (by invitation); b] Modern treatment of burns, Richard J. O'Connell, Jr.; Discussion by Fenwick Beekman. ¶ General discussion. ¶ Executive session.

FEBRUARY 8—*Neurology and Psychiatry.* Reading of the minutes. ¶ Papers of the evening—a] The drama as a therapeutic measure in adolescents, Frank J. Curran; Discussion, Jacob L. Moreno (by invitation), John Levy (by invitation), Thomas K. Davis; b] The psychology of schizophrenia, Paul Schilder; Discussion by Leland E. Hinsie, Abraham A. Brill, Nolan D. C. Lewis (by invitation); c] Fear as a therapeutic agent, Oskar Diethelm (by invitation); Discussion by Edwin G. Zabriskie, Clarence P. Oberndorf. ¶ Executive session.

FEBRUARY 10—*Pediatrics. Residents' Program.* Papers of the evening—a] Cornell University Medical College. A case with unusual intracranial lesion, Charles J. Baker (by invitation); Discussion, Samuel Z. Levine; b] Long Island College of Medicine. Hirschsprung's disease: an acute abdominal emergency with temporary diabetes mellitus four years after lumbar sympathectomy, Vincent Tosti (by invitation); Discussion, Charles A. Weymuller (by invitation); c] New York Medical College. Fusospirochetal bronchitis, C. Michael Witzberger (by invitation); Discussion, J. T. Simonson (by invitation); d] New York Post-Graduate Medical College. The serum treatment of meningococcic meningitis, Charles J. Leslie (by invitation); Discussion, Marshall C. Pease; e] New York University Medical College. A case of pellagra in a colored child, Samuel Prince (by invitation); Discussion, Charles Hendee Smith; f] College of Physicians & Surgeons. Control of repeated attacks of paroxysmal tachycardia with mecholyl, F. Howell Wright (by invitation); Discussion, Rustin McIntosh. ¶ Executive session.

FEBRUARY 15—*Medicine.* Reading of the minutes. ¶ Papers of the evening. Symposium on allergy—a] Recent advances in allergy, Maximilian A. Ramirez; Discussion, Will Cook Spain; b] Clinical manifestations of skin allergy, J. Gardner Hopkins; Discussion, Aaron Brown; c] Bacterial aspects of allergy, William S. Thomas; Discussion, Maximin de Mouy Touart; d] Allergy of the respiratory tract, Robert A. Cooke; Discussion, Horace S. Baldwin. ¶ General discussion.

FEBRUARY 16—*Genito-Urinary Surgery.* Reading of the minutes. ¶ Presentation of cases—Hydatid cysts of the kidney, Luis A. Surraco, Montevideo (by invitation). ¶ Paper of the evening—Recent chemotherapy in infections of the urinary tract, William F. Braasch (by invitation). ¶ Discussion, Henry G. Bugbee, Roy B. Henline, Alexander R. Stevens, Stanley R. Woodruff.

FEBRUARY 16—*Otolaryngology.* Reading of the minutes. ¶ Presentation of cases—a] Bacterial otitic meningitis, Edward R. Roberts (by invitation). ¶ Papers of the evening—a] Primary carcinoma of the external auditory canal and meatus, Otto C. Risch, James R. Lisa; b] The role that surgery of the para-nasal sinuses plays in the asthmatic child, preliminary report, Raymond C. Creasy (by invitation); c] Surgical indications in sinusitis, Daniel S. Cunning (by invitation); d] Sinus complications and their surgical treatment, Robert E. Buckley. ¶ Discussion, Duncan MacPherson. ¶ General discussion.

FEBRUARY 18—*Combined Meeting of the Section of Orthopedic Surgery and the New York Roentgen Society.* Papers of the evening—a] Herniation of the nucleus pulposus. A clinical study (30 minutes), Byron Stookey; b] Radiotherapy of bone tumors (30 minutes), Maurice Lenz, Arthur Purdy Stout; c] Lues of the osseous system (20 minutes), Richard A. Rendich, Bernard Ephrenpreis. ¶ General discussion.

FEBRUARY 21—*Ophthalmology.* Instructional hour—Perimetry, Ralph Lloyd. ¶ Slit lamp demonstration, Milton L. Berliner, Wendell L. Hughes, Girolamo Bonaccolto, Gordon M. Bruce. ¶ Reading of the minutes. ¶ Presentation of cases—a] Suprasellar meningioma, Kaufman Schlivek; b] Total symblepharon with plastic repair, Walter Griffey (by invitation); c] Conjunctival cyst simulating prolapse of lachrymal gland, James W. Smith. ¶ Papers of the evening—a] Subconjunctival section of the ductules of the lachrymal gland as a cure for epiphora, P. Chalmers Jameson (by invitation); b] Obstetrical ophthalmology, Dewey Katz (by invitation); Discussion, Alvin J. B. Tillman, Frances Richman (by invitation).

FEBRUARY 22—*Obstetrics and Gynecology. From The Woman's Hospital, New York City.* Case Report—Unusual irregularity of the fetal heart, Lyman Burnham (by invitation). ¶ Papers of the evening—a] Hemorrhage in late pregnancy, labor, and the puerperium, Ralph L. Barrett; b] Cystocele: its pathology and reconstruction, Joshua W. Davies (by invitation); c] Syphilis: its relation to obstetrics and gynecology, Joseph N. Nathanson (by invitation); d] Postoperative wound disruption, Olaf Severud (by invitation); e] Urological complications following complete hysterectomy, Arthur J. Murphy.

FEBRUARY 23—*Special Joint Meeting of the Section of Pediatrics and The Progressive Education Association.* Symposium on early habit formations in relation to later social adjustments—a] From the viewpoint of the pediatrist, Bronson Crothers, Harvard Medical School (by invitation); b] From the viewpoint of the educator, Caroline B. Zachry, Ph.D., Progressive Education Association (by invitation); c] From the viewpoint of the mental hygienist, William Blatz, St. George's School, Toronto (by invitation); d] From the viewpoint of the psychiatrist, Howard W. Potter; e] A coördination, Herbert B. Wilcox.

AFFILIATED SOCIETIES

FEBRUARY 16—*New York Section of the Society for Experimental Biology and Medicine.* Cataphoretic separation of toxic components of moccasin venom, Walter Marx (by invitation), Samuel M. Peck ¶ The effect of total thyroidectomy upon the production and maintenance of experimental hypertension, Frank Glenn, Earl P. Lasker (Introduced by Bruce Webster). ¶ The use of calcium chloride in the relief of chills following serum administration, Paul B. Beeson, Charles L. Hoagland (Introduced by O. T. Avery). ¶ Feeding glucose to the diabetic, Albert A. Epstein, Milton D. Feltenstein (by invitation). ¶ Vagal innervation of the dog's stomach. Demonstration of its incompleteness in the Pavlov pouch, Edward E. Jemerin (by invitation), Franklin Hollander. ¶ A method for the separation of micro-organisms from large quantities of broth culture, Jonas E. Salk (Introduced by R. Keith Cannan).

New York Roentgen Society. On account of the joint meeting of the New York Roentgen Society with the Section of Orthopedic Surgery, February 18, no meeting of the New York Roentgen Society was held on Monday, February 21.

FEBRUARY 24—*New York Pathological Society in affiliation with The New York Academy of Medicine.* Case reports—a] Nephrosis due to carbon tetrachloride, Hans Smetana (by invitation); b] An unusual case of calcification of the myocardium with subsequent infection, Maurice N. Richter. ¶ Papers of the evening—a] The prognostic significance of intracellular carminophilic material in carcinoma of the female breast, Virginia Kneeland Frantz; b] Observations on immunization with hemolytic streptococci in relation to virulence, D. Murray Angevine. ¶ Executive session.

MEMBERS ELECTED

JANUARY 6, 1938

Boardman M. Bosworth, 58 East 65 Street
James Arnold Brussel, Brentwood, L. I.
Charles Walter Clarke, 50 West 50 Street
John D. Currence, 219 West 44 Street
Wade Duley, 60 East 96 Street
Albert C. Herring, 15 East 77 Street
Francis D. Huber, 9 East 96 Street
Jed Hotchkiss Irvine, 1040 Fifth Avenue
William S. MacComb, 772 Madison Avenue
Clement B. Masson, 405 East 54 Street
Vincent P. Mazzola
133 Clinton Street, Brooklyn
Claude W. Munger, 421 West 113 Street
Alfred Romanoff, 23 East 74 Street
Archibald McIntyre Strong
180 Fort Washington Avenue

FEBRUARY 3, 1938

Vitus William Badia 230 East 48 Street
William Berman
12 Chester Avenue, White Plains
McKeen Cattell, 1300 York Avenue
D. Stoddard Dooman
82 Second Street, Garden City
Jay McLean, 153 East 72 Street
Wilson G. Smillie, 1300 York Avenue
Louis J. Soffer, 1165 Park Avenue
Harry E. Ungerleider, 393 Seventh Avenue

DEATHS OF FELLOWS

ARMSTRONG, ARTHUR SOPER: 103 East 65 Street, New York City; born in Rome, New York, January 14, 1879; died in New York City, January 13, 1938; graduated in medicine from Cornell University Medical College in 1904; elected a Fellow of the Academy February 7, 1918.

Dr. Armstrong was surgeon to the Knickerbocker and Misericordia Hospitals. He was a Fellow of the American College of Surgeons, the American Medical Association and a member of the New York County and State Medical Societies.

BROWN, LAWRASON: 24 Church Street, Saranac Lake, New York; born in Baltimore, Maryland, September 29, 1871; died in Saranac Lake, New York, December 26, 1937; received the degrees of Bachelor of Arts in 1895 and Doctor of Medicine in 1900 from the Johns Hopkins Medical School; elected a Fellow of the Academy November 4, 1915.

Dr. Brown was visiting physician to the Trudeau Sanatorium, Saranac, and consulting physician to the Waverly Hills Sanatorium, Louisville, Kentucky. He was a member of the Board of Trustees of the New York State Hospital for Incipient Tuberculosis at Ray Brook; a member of the Board of Trustees of Potts Memorial Hospital at Livingston; a member of the Advisory Council of the Henry Phipps Institute at the University of Pennsylvania; and of the Advisory Council of the Milbank Foundation.

Dr. Brown was a Fellow of the American Medical Association and a member of the Association of American Physicians, the American College of Physicians, the American Clinical and Climatological Association and its president in 1920; the American Association for Thoracic Surgery, the National Tuberculosis Association and its president from 1919 to 1923; the American Public Health Association, and the County and State Medical Societies.

He was the author of the book "Rules for Recovery from Tuberculosis" and contributed many articles for journals on this topic.

FEIT, HERMANN: 952 Fifth Avenue, New York City; born in Colfeuce on the Rhine, Germany, August 29, 1890; died in New York City, January 19, 1938; graduated in medicine from the University of Bonn, Germany, in 1918; elected a Resident Fellow of the Academy January 5, 1928, and designated a Fellow in Dermatology and Syphilology in 1933.

Dr. Feit was dermatologist to the Vanderbilt Clinic, dermatologist and syphilologist to the Ruptured and Crippled Hospital and consulting dermatologist to the Englewood and Greenville Hospitals of New Jersey. He was a Fellow of the American Medical Association and a member of the County and State Medical Societies.

GOLDSTEIN, ISADORE: 1095 Park Avenue, New York City; born in New York City in 1887; died in New York City, December 23, 1937; graduated in medicine from Cornell University in 1904; elected a Fellow of the Academy May 2, 1918.

Dr. Goldstein was ophthalmic surgeon and Associate in ophthalmology to the Mount Sinai Hospital; senior assisting surgeon to the New York Eye and Ear Infirmary; and consulting ophthalmologist to the Sydenham Hospital.

He held a certificate from the American Board of Ophthalmology and was a member of the American Academy of Ophthalmology and Otolaryngology and the County and State Medical Societies.

LEVY, RALPH J.: 25 Central Park West, New York City; born in New York City, February 10, 1888; died in New York City, December 12, 1937; graduated in medicine from the New York Homeopathic Medical College and Flower Hospital in 1914; elected a Fellow of the Academy January 6, 1927.

Dr. Levy was a Fellow of the American College of Surgeons, the American Medical Association, and a member of the County and State Medical Societies.

MILESTONES IN MEDICINE

UNDER this appropriate title the 1936-37 series of the Laity Lectures of The New York Academy of Medicine is published. The book contains a brief introduction by James Alexander Miller, President of the Academy, and seven addresses on the historical and psychological aspects of medicine.

We have read each of these with pleasure and profit, and are impressed with the ability displayed by these distinguished scientists in presenting the results of intricate research in a form and style agreeable to laymen as well as physicians.

The names of the contributors and the titles of the addresses may suggest in some measure the reason for the widespread interest manifested this year in the publication of the Laity Lectures; but the enjoyment derived from reading this little book indicates the well founded basis for its popularity.

The contributors to "Milestones in Medicine" and the subjects of the addresses are:

SMITH ELY JELLIFFE	The Historical Background of Psychiatry
CHARLES R. STOCKARD	The Mechanisms of Heredity
KARL VOGEL	Medicine at Sea in the Days of Sail
FREDERICK TILNEY	The Evolution of the Human Brain
HENRY E. SIGERIST	The History of Medical History
NEWTON E. WAYSON	The History of Leprosy
WALTER TIMME	The Story of the Glands of Internal Secretion

The book is published by the D. Appleton-Century Company; contains 276 pages and costs two dollars.

POSTPONEMENT OF EXHIBITION OF PORTRAITS

THE exhibition of portraits of Presidents of The New York Academy of Medicine announced for February 14-25 has been postponed to April 18-30. The Academy extends an invitation to physicians and to the general public to view this exhibition.